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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/785,759	02/16/2001	Ranjit Gharpurey	TI-31261	2970

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TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
DALLAS, TX 75265

EXAMINER

YUN, EUGENE

ART UNIT	PAPER NUMBER
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2682

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/785,759

Applicant(s)

GHARPUREY, RANJIT

Examiner

Eugene Yun

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morishige et al. (US 6,600,911) in view of Bednekoff et al. (US 6,603,810).

Referring to Claim 1, Morishige teaches a radio, comprising:

a duplexer 17 (fig. 2);

a transmitter section 22 (fig. 2) coupled to the duplexer, the transmitter section transmitting at a center frequency; and

a receiver section 21 (fig. 2) coupled to the transmitter section, the receiver section including a first down conversion section 4 (fig. 2) comprising first and second mixers (see the two mixers inside 4 of fig. 2).

Morishige does not teach mixers receiving a first local oscillator (LO) signal having a frequency equal to the center frequency of the transmitter section or a sub-harmonic thereof. Bednekoff teaches mixers receiving a first local oscillator (LO) signal 365 (fig. 3) having a frequency equal to the center frequency of the transmitter section or a sub-harmonic thereof (see col. 2, lines 44-47). Therefore, it would have been

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obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Bednekoff to said method of Morishige in order to better reduce the interference in the radio.

Referring to Claim 8, Morishige teaches a method for minimizing the interference caused by the transmit signal produced by the transmit section 22 (fig. 2) on the receiver section 21 (fig. 2) of a frequency division duplexed (FDD) radio, the receiver section having a first down conversion section 4 (fig. 2), the method comprising the steps of:

providing a local oscillator (LO) signal 5 (fig. 2) to the first down conversion section of the receiver (see col. 7, lines 19-23); and

filtering the output of the first down conversion section of the receiver 6 (fig. 2 and col. 7, lines 14-19).

Morishige does not teach the LO signal having a frequency equal to the center frequency of the transmit signal or a sub-harmonic thereof. Bednekoff teaches the LO signal having a frequency equal to the center frequency of the transmit signal or a sub-harmonic thereof (see col. 2, lines 44-47). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Bednekoff to said method of Morishige in order to better reduce the interference in the radio.

Referring to Claim 2, Morishige also teaches the radio as a frequency domain duplexed (FDD) radio (fig. 2).

3. Claims 3-7 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morishige and Bednekoff in view of Tolson et al. (US Patent App. 09/413,725).

Referring to Claim 3, the combination of Bednekoff and Morishige does not teach a first high pass filter coupled to the output of the first mixer and a second high pass filter coupled to the output of the second mixer. Tolson teaches a first high pass filter 10 (fig. 1) coupled to the output of the first mixer and a second high pass filter 11 (fig. 1) coupled to the output of the second mixer (see pg. 4, lines 16-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Tolson to the modified device of Morishige and Bednekoff in order to reduce the size of the radio while enhancing reliable operations.

Referring to Claim 9, the combination of Bednekoff and Morishige does not teach high pass filtering the output of the first down conversion section. Tolson teaches high pass filtering the output of the first down conversion section (see 10 and 11 of fig. 1 and pg. 4, lines 16-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Tolson to the modified device of Morishige and Bednekoff in order to reduce the size of the radio while enhancing reliable operations.

Referring to Claims 5 and 11, Tolson also teaches cascaded single pole high pass filters (fig. 1 and pg. 5, lines 20-24). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Tolson to the modified device of Morishige and Bednekoff in order to reduce the size of the radio while enhancing reliable operations.

Referring to Claim 6, the combination of Morishige and Bednekoff does not teach the high pass filters having an output and a first set of two mixers coupled to the output of the first high pass filter and a second set of two mixers coupled to the output of the second high pass filter. Tolson teaches the high pass filters 10 and 11 (fig. 1) having an output and a first set of two mixers 6 (fig. 1) coupled to the output of the first high pass filter and a second set of two mixers 12 (fig. 1) coupled to the output of the second high pass filter (see pg. 6, lines 13-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Tolson to the modified device of Morishige and Bednekoff in order to better enhance the performance of the radio.

Referring to Claims 4 and 10, Morishige also teaches integrated DC blocking capacitors (see col. 11, lines 12-17).

Referring to Claim 7, Tolson also teaches a first mixer of the first set of two mixers providing an in-phase component at an output and a second mixer of the first set of two mixers providing a quadrature component at an output (fig. 1) and further comprising:

a first adder 5 (fig. 1) having a first input for receiving the output of the second mixer of the first set of two mixers, and a second input for receiving the output of the first mixer of the second set of two mixers, said first adder having an output for providing an in-phase component base band signal (see pg. 5, lines 5-12); and

a second adder 5 (fig. 1) having a first input for receiving the output of the first mixer of the first set of two mixers, and a second input for receiving the output of the

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second mixer of the second set of two mixers, said second adder having an output for providing a quadrature component base band signal (see pg. 5, lines 5-12). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Tolson to the modified device of Morishige and Bednekoff in order to better enhance the performance of the radio.

Referring to Claim 12, Tolson also teaches down converting the high pass filtered output using a second down conversion section 21 (fig. 1 and pg. 5, lines 14-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Tolson to the modified device of Morishige and Bednekoff in order to better enhance the performance of the radio.

Referring to Claim 13, Tolson also teaches a first high pass filter 10 (fig. 1) coupled to the output of the first mixer, for passing frequencies including an intermediate frequency corresponding to a difference between the center frequency of the receiver section and the center frequency at which the transmitter section transmits (see pg. 4, lines 16-23); and

a second high pass filter 11 (fig. 1) coupled to the output of the second mixer, for passing frequencies including an intermediate frequency corresponding to a difference between the center frequency of the receiver section and the center frequency at which the transmitter section transmits (see pg. 4, lines 16-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Tolson to the modified device of Morishige and Bednekoff in order to better enhance the performance of the radio.

Referring to Claim 14, Morishige teaches a method of operating a receiver 21 (fig. 2) in an FDD radio to remove, from a desired receive signal, interference caused by a transmitter 22 (fig. 2) transmitting at a transmit center frequency, the desired receive signal having a receive center frequency that is different from the transmit center frequency, comprising the steps of:

Mixing the receive signal with a local oscillator frequency 5 (fig. 2) to provide a down-converted receive signal 4 (fig. 2).

Morishige does not teach the local oscillator frequency equal to the transmit center frequency of a sub-harmonic thereof. Bednekoff teaches the local oscillator frequency equal to the transmit center frequency of a sub-harmonic thereof (see col. 2, lines 44-47). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Bednekoff to said method of Morishige in order to better reduce the interference in the radio. The combination of Morishige and Bednekoff does not teach high pass filtering the down converted receive signal and converting the high pas filtered down converted receive signal to a baseband signal. Tolson teaches high pass filtering the down converted receive signal (see 10 and 11 of fig. 1) and converting the high pas filtered down converted receive signal to a baseband signal (see col. 4, lines 27-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Tolson to said method of Morishige in order to better enhance the performance of the radio.

Response to Arguments

4. Applicant's arguments filed 3/24/2004 have been fully considered but they are not persuasive.

The independent claims state the limitation of "said first and second mixers receiving a first local oscillator (LO) having a frequency equal to the center frequency of the transmitter section **or "inherently" (noted by examiner) a sub-harmonic thereof.**

While the examiner agrees with the argument that the receiving LO frequency is not equal to the center frequency of the transmitter section in the Bednekoff reference, the examiner further states that the receiving LO frequency is equal to a sub-harmonic thereof. The examiner believes that it is inherent to one skilled in the art that the receiving LO frequency in most dual-band radios should be equal to a sub-harmonic of the transmitting center frequency in order to minimize noise. Therefore, the examiner still believes that the Bednekoff reference teaches first and second mixers receiving a first local oscillator (LO) having a frequency equal to a sub-harmonic of a center frequency of the transmitter section, and that the combination of the Morishige and Bednekoff references still read on the independent claims.

The examiner referred to the application (09/413,725) in this office action to show that the Tolson reference can be used as a reference for the above claims.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Yun whose telephone number is (571) 272-7860. The examiner can normally be reached on 9:00am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nick Corsaro can be reached on (571) 272-7876. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Eugene Yun
Examiner
Art Unit 2682

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MARCEAU MILORD
PRIMARY EXAMINER